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GLOBAL SYSTEMIC VENTRICULAR LONGITUDINAL STRAIN IS REDUCED IN ADULTS WITH TRANSPOSITION OF THE GREAT ARTERIES AND A SYSTEMIC RIGHT VENTRICLE AND RELATES TO SUBPULMONARY VENTRICULAR FUNCTION AND ADVERSE CLINICAL OUTCOME

ACC Poster Contributions
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Session Title: Adult Congenital Heart Disease
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Background: Transposition of the great arteries (TGA) after atrial switch operation and congenitally corrected TGA (ccTGA) are associated with impaired systemic right ventricular (RV) function. We investigated the value of novel indices of myocardial deformation on speckle-tracking echocardiography for quantifying ventricular function, and its potential role in assessing ventricular-ventricular interaction and outcome.

METHODS AND **Results:** 129 patients (87 with TGA and atrial switch and 42 ccTGA; 71 male, age 35±12 years) were investigated and biventricular myocardial deformation was compared with findings in normal subjects (n = 38, age 36±10 years). Systemic (RV) ventricular longitudinal 2D- peak systolic strain (2D-LS) was significantly reduced compared to controls (-12.9±3.6 vs. -15.4±5.1 and - 21.0±5.5 in TGAs, ccTGAs and controls; $p<0.0001$). Systemic and subpulmonary 2D-LS were correlated in TGA ($r=0.46$, $p<0.0001$) and ccTGA patients ($r=0.64$, $p<0.0001$), suggesting interventricular interaction, and this was confirmed when ejection fraction on MRI was assessed ($r=0.53$, $p<0.0001$). In addition, systemic 2D-LS (OR=1.11, $p=0.025$) and subpulmonary 2D-LS (OR=1.11, $p=0.002$) were related to adverse clinical outcome (NYHA class>2, history of clinically relevant arrhythmia, ventricular tachycardia or death) independently of diagnosis or functional class.

Conclusions: Right ventricular global systolic strain is significantly reduced in patients with TGA and systemic right ventricles. Similar to patients with tetralogy of Fallot, systemic and subpulmonary myocardial function are interrelated in patients with TGA and this is likely due to an adverse ventriculo-ventricular interaction. Furthermore, biventricular dysfunction on speckle tracking echocardiography was related to adverse clinical outcome in this cohort of adults with TGA and systemic right ventricles.